Barriers to Introducing Salad Bars Among Schools in Arizona: A Cross Sectional Study Across School Levels

by

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ABSTRACT

Salad bars are promoted as a means to increase fruit and vegetable consumption among school-age children; however, no study has assessed barriers to having salad bars. Further, it is not known if barriers differ across school level. This cross-sectional study investigated the barriers to having salad bars across school level among schools without salad bars in Arizona (n=177). Multivariate binominal regression models were used to determine differences between the barriers and school level, adjusting for years at current job, enrollment of school, free-reduced eligibility rate and district level clustering. The top five barriers were not enough staff (51.4%), lack of space for salad bars (49.7%), food waste concerns (37.9%), sanitation/food safety concerns (31.3%), and time to get through the lines (28.3%) Adjusted analyses indicated two significant differences between barriers across school level: time to get through lines (p=0.040) and outside caterer/vendor (p=0.018) with time to get through lines reported more often by elementary and middle school nutrition managers and outside caterer/vendor reported most often by high school nutrition managers. There were several key barriers reported and results indicate that having an outside vendor/caterer for their meal programs and time to get through the service lines varied across school level. High schools report a higher percent of the barrier outside caterer/vendors and elementary and middle schools report a higher percent of the barrier time to get through the lines. Results indicate that research determining the approximate time it takes students to get through salad bar lines will need to be considered. More research is needed to determine if the barrier time to get through the service lines is due to selection of food items or if it is due to the enrollment size of the lunch period. Future research interventions

may consider investigating food safety and sanitation concerns of middle school nutrition managers. Findings may be used to guide ways to decrease barriers in schools without salad bars.

DEDICATION

I would like to dedicate this thesis to my amazing parents. My mom and dad have always supported me throughout all of my endeavors and I am so fortunate to have them as my parents. They always allowed me to pursue my goals without question. I know I could not have accomplished as much as I have in life without their guidance. I would also like to dedicate this thesis to my sister, Angie. My sister forced me to take breaks throughout this graduate program by asking me to accompany her to activities such as taking a barre class or going for a hike. I have always looked up to my sister's many accomplishments and she, as well as my parents, have inspired me reach my full potential. I would also like to dedicate this thesis to my dog, Roxie. Roxie helped me take breaks from my thesis by climbing up on my chair and giving me "the look," which meant she wanted me to play with her or to take her for a walk.

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CHAPTER 1

INTRODUCTION

Overview

Youth do not consume enough fruits and vegetables.[1-3] Fruits and vegetables are extremely important to consume on a regular basis, however, in the United States only 6.2% and 5.8% of adolescents (12-18 years old) meet the recommendations for fruit and vegetable consumption, respectively.[4] The average child in the United States has a diet that is high in fat, saturated fat and sodium.[1] Eating patterns that are established during youth can help encourage ideal growth, health and brain development.[1] According to the World Health Organization it is estimated that gastrointestinal cancer, ischaemic heart disease, and strokes can be attributed to a low fruit and vegetable intake.[5]

Research studies have shown that school lunch programs can influence a child's diet through offering a wide range of healthy foods.[6-8] The school meal program serves over 31 million students daily with children receiving nearly half of their total daily energy intake.[9, 10] Schools can promote a healthier well being for their students by incorporating and increasing access to fruits and vegetables into their meal programs.

Salad bars are being recommended as a way to address the lack of access to fruits and vegetables for children in schools.[11] Most salad bars evaluated offer at least one vegetable with the most frequent ones being lettuce, tomatoes and other raw vegetables.[12] Even though the USDA is putting forth an effort to promote salad bars, there are still many individuals and corporations who are against it. For

example, the advancement of salad bars took a step back a couple of years ago when the National Science Foundation issued recommendations informing elementary schools that due to the food safety concerns, self-serve salad bars should not be put into effect.[13] These bars also require monitoring by adults, which then equates to more money being spent in order to watch the self-service salad bar.[13] In addition, salad bars lines take up a great deal of time.[13] Most students only get approximately 30 minutes for lunch;[14] therefore, if these bars are self-service, it may be difficult for schools to accommodate extra time in self-service meal lines. This can be difficult in largely populated schools.[13]

Although studies have assessed how salad bars in schools increase fruit and vegetable consumption in children, studies have not assessed the prevalence of each of the barriers to salad bars among schools without salad bars across elementary, middle and high school levels. The United States Department of Agriculture (USDA) conducted a study on the barriers to expanding salad bars, discovering that most obstacles were related to cost, which suggested that more studies need to be done to confirm or refute their findings.[12] Subjective reports specify that a number of school systems think that salad bars increase meal costs because of the need for significant upfront equipment investment in addition to reoccurring costs connected to increased food and labor costs.[12]

The purpose of this study is to assess the barriers to having salad bars among elementary, middle and high school without salad bars. This research is significant for future interventions that could address the barriers to implementing salad bars in schools. If the school food service authorities and other decisions makers are aware of the barriers that schools encounter when trying to establish salad bars,

then schools or school nutrition managers could get support to reduce those barriers. In addition, this thesis may identify unique barriers across school levels (elementary, middle and high), which will aid in guiding intervention development addressing specific barriers.

The Purpose of Study

The purpose of this secondary data analysis is to assess the prevalence of barriers to having salad bars at schools that do not have salad bars across school level in Arizona, utilizing a cross-sectional survey given to school nutrition managers to assess the statewide prevalence and predictors of salad bars.

Research Aim and Hypotheses

Study Aim: To determine the prevalence of perceived barriers to salad bars in schools without salad bars and to determine whether these barriers differ across school level.

Research Question 1: What is the primary perceived barrier to not having a salad bar?

H_1: The primary perceived barrier to not having a salad bar will be no budget for future maintenance.

Research Question 2: Do perceived barriers to not having a salad bar differ across school level?

H_1: Perceived barriers to not having salad bars will not differ across school level.

Definition of Terms

Salad Bars: Defined in the survey as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars and/or condiment bars.

Cafeteria/Nutrition Manager: A professional who manages the school's nutrition program at the school-level and has school-level oversight of serving the school meals.

Limitations and Delimitations

Limitations to this study need to be taken into account. Firstly, since the data are self-reported by the school nutrition manager, it could lead to self-report bias. Secondly, the study is a cross-sectional study, which means that causal relationship may not be made between the barriers and not having a salad bar, as there may be additional factors involved. A third limitation would be sampling bias as it is a convenience sample of schools in Arizona and may not represent all schools in Arizona or the United States (selection bias). Lastly, there are the unaccounted for confounders that it will not be possible to control for such as: race/ethnicity, gender and age of the respondents.

A delimitation of this study was that participants were nutrition managers from elementary, middle and high school in Arizona. The results may not be generalizable to all elementary, middle and high schools across the nation.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

Today's youth does not consume enough fruits and vegetables.[1-3] The 2010 Dietary Guidelines for Americans, developed by the United States Department of Agriculture (USDA) and the United States Department of Health and Human Services (USDHHS), recommend an increase in fruit and vegetable consumption due to the substantial benefits gained such as increased dietary fiber, folate, vitamins and phytochemicals.[15] Fruit and vegetable consumption in children is extremely imperative for growth.[1] Eating patterns that are established during youth can help encourage ideal growth, health and brain development.[1] The consumption of both fruits and vegetables is vital in order to avert diseases such as coronary heart disease, cancer and stroke.[1, 16] Atherosclerosis, the most common cause of coronary heart disease, can begin formation during youth.[1] Fruits and vegetables are high in essential vitamins and low in saturated fats that can cause these severe issues.

One way to increase fruit and vegetable consumption among youth is by changing the school environment since children eat 25-33% of their total calorie intake at school.[1, 17] In addition, in the United States over half of students receive breakfast or lunch from school.[18] Research has shown that cost related issues, such as equipment, labor and food, are barriers to changing the school food environment.[19] The Center for Disease Control (CDC) has initiated strategies to help change the school environment through the use of a Coordinated School Health Program encouraging student health and education.[20] One of their strategies

involves applying a valuable school meal program through the use of the USDA's Team Nutrition tool kit,[20] which assists schools on serving and marketing healthy school meals.[20]

Recommendations of Fruit and Vegetable Intake for Children

The 2010 Dietary Guidelines for Americans recommend an increase in fruit and vegetable consumption for all people two years and older accentuating consumption of whole fruit as opposed to juice.[21] In addition, the 2010 Dietary Guidelines recommends consuming a diversity of vegetables such as: dark green, orange and red vegetables and legumes.[21] In 2007-2010 research was conducted on children ages 1-18 and informed the population that 60% of children did not meet the USDA's fruit recommendation and 93% did not meet vegetable guidelines.[22] Healthy People 2020 recommends increasing fruit intake to 0.9 cup-equivalents per 1,000 calories and increasing vegetable intake to 0.8 cup-equivalents per 1,000 calories.[23]

Children's fruit and vegetable consumption today is at 1.9 servings to 2.5 servings per day, which is below the recommended guidelines.[24, 25] Research has also shown that this consumption decreases significantly through elementary school.[26] The American Institute for Cancer Research suggests consuming a variety of fruits and vegetables throughout the year and eating five portions per day of fruits and vegetables throughout the year for children as well as adults.[27]

Importance of Fruit and Vegetable for Children

According to the World Health Organization it is estimated that 19% of gastrointestinal cancer, 31% of ischaemic heart disease, and 11% of strokes can be contributed to a low fruit and vegetable intake.[5] Research has shown that the more energy-dense, low nutrient foods one consumes, the less one attains essential vitamins and minerals needed to sustain healthy body functions.[28] The population as a whole consumes too little fruits and vegetables, thus limiting sources of dietary fiber, folate, vitamins, potassium and phytochemicals.[29] These specific nutrients are vital to children, especially since they are still growing and developing.

In the United States today, children's diets are low in fruits and vegetables and high in saturated fats, trans fats and cholesterol. When infants start consuming adult foods, the most common types of foods children start consuming are French fries.[30] Research also shows that fruit consumption declines throughout childhood, with 60% eating baked desserts, 20% consuming candy and 44% drinking sweetened beverages daily.[30] These same instances are then transitioned as children get older where they increase the amount of snacks consumed, the amount of fried foods eaten, the amount of portion sizes at each meal, and tend to move away from high-fiber fruits and vegetables.[31-35] To add to this point, research has shown a significant increase in sodium intake and a decrease in calcium and potassium intake during childhood years.[36-38] Fruits and vegetables are proven high in these essential nutrients and low in sodium.

It is extremely important that children receive proper nutrients as they are in the developmental stages of growth.[39] They need proper nutrition from healthy foods in order to attain micronutrients and vitamins that assist in development such

as: calcium, iron, zinc, potassium and vitamins A, D, C and folic acid.[40, 41] However, most individuals in this group are consuming too many sweetened beverages and fast food items and not enough fruits, vegetables, dairy foods, whole grains, lean meats and fish.[39] The "unhealthy" foods are loaded with trans fats, saturated fats, and added sugars, which do not help with providing the body with the nutrients it needs to attain sufficient growth development.[40, 41]

Fruit and Vegetable Intake and Academics

How a child performs academically will have a great influence on his/her future success and health, another reason for raising this issue as a major public health concern.[42] Florence et al studied the relationship of fruits and vegetables (a good quality diet) and academic performance, finding that the students who were consuming the most fruits and vegetables were much less likely to have reduced academic performance.[42] Assisting in the development of nutritious eating behaviors early in life for children is crucial for maximizing their academic performance during the school year.[42, 43] Children's academic performance in grade school will affect their future educational achievements and income, which can then influence their health and overall life.[42] School-based interventions that promote healthful habits in children have been shown to be beneficial in improving academic performance for their students.[44, 45]

Health Outcomes of Fruit and Vegetable Consumption in Children

There are many studies that have researched the health benefits of fruit and vegetable consumption in children such as, decreased risk of diabetes, decreased

consumption of energy dense foods and increased vital nutrients.[46-49] Also, fruit and vegetable consumption may be protective against numerous childhood illnesses such as iron deficiency anemia, eating disorders, under nourishment and dental caries.[1, 50] In addition, study with a sample size of 20,000 children found a relationship between respiratory symptoms and low fruit and vegetable consumption.[51]

Dietary factors have been linked to the cause of 1/3 of all cancers.[27] With cancer being the second leading cause of death in the US, it has become a major public concern.[27] Fruits and vegetables encompass a variety of nutrients such as fiber, antioxidants and other anti-carcinogenic compounds that assist in preventing cancer.[52] Studies have found that fruit and vegetable consumption are protective against cancers such as: stomach, esophagus, lung, oral cavity and pharynx, endometrium, pancreas and colon.[52]

Prevalence of Fruit and Vegetable Consumption in Children

The current USDA recommendations for fruit and vegetable consumption are 1.5 cups of fruits and 2.5 cups of vegetables for a 1800 kcal diet.[53] The actual intake in children, however, is much lower than this recommendation.[54, 55] Research from the 2011 Youth Risk Behavior Survey showed that 4.8% of high school students had not consumed any fruit juices and 5.7% had not consumed any vegetables over a seven-day period.[56] Findings from the USDA survey support this verdict that children do not consume enough fruits and vegetables when they discovered that only 36.4% of US children aged 2-19 eat the recommended amounts of vegetables, and 26% consume the recommended servings of fruits.[57] In order to address this

issue, it is necessary to increase the availability and accessibility to these types of healthy foods; thus improving the quality of a child's diet.[58]

In a study conducted on 6,513 children and adolescents, it was found that vegetable consumption per day did not differ across age groups; however, fruits per day were consumed a great deal more by younger children.[59] The most common vegetable source was French fries, accounting for over 28% of total vegetable intake with the adolescent age group consuming more French fries than the younger children age group.[59] The most common fruit was 100% fruit juice, which accounted for over 40% of total fruit intake for younger children.[59] The study also showed that although boys consumed more total vegetables when compared to girls, vegetables were not any different by gender.[59] All in all, findings revealed that a large number of children and adolescents were below the recommendation levels for fruit and vegetable intakes.[59] It also showed that younger children, 2-5 year olds, consumed more fruit when compared to older children, 6-11 year olds and adolescents, 12-18 year olds.[59]

An additional study examined 3,148 children ages 2-18, revealing that French fries comprise almost ¼ of all vegetables eaten by children and adolescents with only 20% of today's youth consuming the recommended servings of fruits and vegetables.[3]

Sources of Fruit and Vegetable for Children

The main sources of fruits and vegetables for children are either from school or at their home. Additional sources can be from child-care and after-school youth programs, restaurants, vending machines, convenience stores, work sites.[60] If

children attend lower socioeconomic status schools, their prevalence of fruits and vegetables might be decreased compared to those students who attend higher socioeconomic status schools.[61] Research has shown that lower socioeconomic schools tend to have decreased amounts of fruit and vegetable offerings compared to higher socioeconomic schools.[61]

Children also can attain sources of fruits and vegetables from their home. One study discovered that when fruits and vegetables are available at the child's home, then the child would more likely consume them.[61] However, when fruits and vegetables are not available at the home, this presents a great obstacle to the children's long-term fruit and vegetable consumption habits.[61] In addition, one research study found that when fruits and vegetables were more obtainable and reachable at the home, it made it more likely that the students would consume more fruits and vegetables.[61] Since it can be more difficult to attain fruits and vegetables at the home, this makes it even more essential for schools to have them available. Schools provide a critical location to promote more fruit and vegetable consumption. Yet, more research is needed to determine barriers to fruit and vegetable consumption in schools.

Environmental Interventions to Promote Fruits and Vegetable Consumption in Schools

A good starting point for schools would be to develop policies and programs that assist in developing healthy eating standards.[62] Schools reach all different types of children and can have everlasting impacts on them all.[62] Over 48 million students go to 94,000 public elementary, middle and high schools every day.[63] There is no

other type of program that reaches during the first 18 years of children's lives as school does.[62] It is the school's responsibility to not only set their students up for academic success, but they also need to educate them on the importance of living healthy lives.[63]

Eating behavior change in populations once focused mainly on growing individual knowledge by using educational approaches in settings such as schools, worksites and grocery stores.[64] Eating behavior change has recently shifted to focus more on the role of environmental influences on food choices and how that can affect environmental variables.[65, 66] These environmental influences can include food availability, price, promotion and social influences.[31] It is crucial to target fruit and vegetable environmental interventions at the youth level.[31]

There have been several studies done on changing the school nutrition environment through the use of environmental interventions.[8, 67, 68] For example, one study observed numerous environmental strategies to increase fruit and vegetable consumption in elementary school children.[8] Another group of studies investigated a single environmental change to increase fruit and vegetable consumption in school.[67, 68] One study examined the effects of fruit and vegetable intake of increases in the availability of low cost fruit and vegetable in elementary schools[68] and the other studied the effects of lowering prices of fruit and vegetables on student fruit and vegetable purchases in secondary schools.[67]

Perry et al. randomized 26 elementary schools to an intervention group that used only environmental strategies to increase fruit and vegetable intake for first and third grade students.[8] For this intervention, fruit and vegetable availability in school was increased and additionally, the food service staff was trained to verbally

encourage fruit and vegetable participation to the students.[8] The intervention also included monthly taste-test of fruits and vegetables during lunch.[8] Once a year, there were fruit and vegetable contests for students to participate in if they were to consume at least three servings of fruits and vegetables per day at lunch for a week.[8] The overall results of this intervention showed an increase in FV (no potatoes), FV (no potatoes, no juice), F (with and without juice).[8] The differences between the control and intervention group were about +.14 to +.17 servings.[8] In addition, evaluation data determined that the intervention schools had increased amounts of fruits and vegetables at lunch and increase of verbal encouragement for consumption of fruits and vegetables at lunch when compared to the control schools.[8]

Eriksen et al. examined the effects of fruit and vegetable subscription program on fruit and vegetable intake in children 6 to 10 years old.[68] This was a nonrandomized study that included four intervention schools and three control schools.[68] The results of the five week subscription program indicated that for the intervention groups fruit intake increased (+.35 servings/day).[68] However, there was no significant difference between the intervention and control schools regarding vegetable intake.[68]

French et al. studied the effects of lowering prices of fruits and vegetables in two secondary school cafeterias.[67] Prices were reduced by 50% over a three-week period.[67] The results of this study showed significant increases in sales of fresh fruit and baby carrots.[67] The sales of baby carrots increased twofold; however, the salad sales did not increase significantly during the lowering period.[67] The overall results of this study inform us that lowering the prices of fruits and vegetables in secondary schools is effective at increase student sales of the items.[67]

School Lunch Environment to Promote Fruits and Vegetables

Schools offer a wide variety of potential food choices.[69] Research studies have shown that school lunch programs can influence a child's diet through offering a broad selection of healthy foods.[6-8] To substantiate this further, studies have shown that what children eat in school can have a vital impact on their nutrition. The school meal program serves over 31 million students daily[9] with children receiving an average of 47% of their total daily energy intake.[10] Looking at these children, over 60% are at risk for being obese, developing diabetes, and continuing poor nutrition habits.[70] A study conducted by Ronette et al found that 95% of children eat at least one meal or snack at school with 91% of those meals usually lunch.[71] The Institute of Medicine suggests that schools are in a distinctive position to impact the diets of children because children eat up to two meals a day at school.[72, 73]

The "Kids Choice" school lunch program was designed to increase fruit and vegetable consumption for students (first, second and fourth graders) and focus merely on changing the school lunch procedures through the use of reinforcement, food choice and peer participation.[74] The results implied that the "Kids Choice" program was effective in increasing fruit and vegetable consumption for the specified grades.[74] However, increases were only temporary and returned to baseline measures seven months after the program ended.[74]

Schools have made efforts to advance the quality of school meals by incorporating farm-to-school programs.[75] This program enables local farmers to deliver freshly grown produce to school food service cafeterias and school gardens.[75] There have been several studies done showing that gardens increase fruit and vegetable intake in children.[76-78]

Further school food items could be from snack bars, a la carte programs, vending machines and school stores, with the students sometimes being allowed to leave campus and buy their own food items.[69] The School Nutrition Dietary Assessment conducted an analysis, finding that 90% of schools offer a la carte programs during the lunch period.[79] In addition, vending machines were accessible to 76% of high schools, 55% of middle schools and 15% of elementary schools.[79] And, lastly, school stores or snack bars were available in 41% of high schools, 35% of middle schools and 9% of elementary schools.[79] These types of items were very limited in their supplies of fresh fruit or fruit juice.[80]

Additionally, the school's food service staff can help to promote healthy behaviors by incorporating healthier food items into the meals.[81] Ronette et al assessed the relationship between school food environments and children's dietary behaviors in school, discovering that children attending elementary schools not offering fried foods in school lunches ate fewer calories at school.[71] Also, Kubik et al. found a positive relationship between school food practices that supported frequent snacking and food that was high in calorie, low in nutrient and children's body mass index levels (BMI).[82] Other research has shown that the BMI of children increases by 0.10 BMI unit for each food practice allowed by the school.[82] Lastly, Anderson et al. collected all of these data on school food policies examining the relationship between the availability of "junk food" and children's BMI levels.[83] What the researched indicated was a 1% increase in children's BMI when schools permitted the children access to "junk foods".[83] All things considered, when the school's food service staff works towards providing healthier options such as fresh fruits and vegetables, it can have potential to eliminate the more competitive options available.

Research has displayed that 62% of all public school children consume low-nutrient, energy dense foods while at school and that 45% of these low-nutrient, energy dense foods were acquired from school.[71] The researchers from this study found that those children who were consuming the low-nutrient, energy dense foods from school were adding an average intake of 199 kcal, 176 kcal for elementary school children and 241 for high school children.[71] The most popular types of low-nutrient, energy dense food items researchers found in schools were baked good and desserts.[71] These items contribute to an extra 178 kcal for elementary students and an extra 230 kcals for high school students.[71] This study also showed evidence that only about half of children, 54%, admitted to eating a fruit or vegetable attained from school.[71] The elementary aged children reported an average of 0.5 MyPyramid cup equivalents per day and the secondary schools reported 0.3 cup equivalents per day.[71] School children that attended schools that did not sell sugar-sweetened beverages reduced their consumption of these kinds of drinks by 22 kcal per school day with regards to middle school children and 28 kcal per school day with regards to high school children.[71]

In addition, another research study looked at the association of school food environment with dietary behaviors.[69] This study found that when students do not have a la carte programs, they are more likely to meet daily recommendations for fruit and vegetable intake.[69] The opposite occurred for students that attend schools that have a la carte programs in that they are less likely to meet the recommendations for fruits and vegetables and also have higher levels of calories from fat and saturated fat.[69] The study concluded that there is a need for healthier food items in schools.[69] The findings for vending machines were the exact same;

however, vending machines were not seen to increase dietary fat intakes.[69] This study suggests that schools should decrease the amount of fried potatoes; instead, offering more varieties of fresh fruits and vegetables to students.[69]

Healthy Hunger Free Kids Act

In 2010, Congress passed the Healthy Hunger Free Kids Act. This act was put into affect during the 2012-2013 school year.[84] The nutrition standards for the National School Lunch Program (NSLP) were updated to redirect the lunch programs and focus them to meet the guidelines of the 2010 Dietary Guidelines for Americans with more stress on the importance of fruits, vegetables, whole grains and low fat milk.[81, 84] This act was aimed at increasing the availability of whole grains, fruits and vegetables[85] as well as reducing saturated fat, trans fat and sodium in schools.[81] In addition, this act ensures that students are offered fruits and vegetables every day of the week.[86] Under this rule any food sold in schools must be either a fruit, vegetable, dairy product, protein food, a whole grain rich product or a combination food containing at least ¼ cup of fruit or vegetable or contain 10% of the Daily Value of a nutrient.[86] Also, weekly vegetables will be offered and planned out around five-sub groups.[87] Each week will have ½ cup dark green vegetable (broccoli, spinach, greens) for all grades, ¾ cup red/orange vegetable (carrots, sweet potatoes, tomatoes) for grades K-8 and 1 ¼ cup for grades 9-12, ½ cup legumes (dried peas and beans) for all grades, ½ cup starchy vegetables (potatoes, corn, peas, lima beans) for all grades, ½ cup other vegetable (green beans, squash, celery, cucumbers) for grades K-8 and ¾ cup for grades 9-12 and 1 cup additional vegetables for grades K-8 and 1 ½ cup for grades 9-12.[87] Students in grades K-8 will be presented with at least ½ cup

fruit and grades 9-12 will be presented with at least 1 cup of fruit.[87] Schools are now having to provide a means to meet these new fruit and vegetable guidelines.

Barriers to Making Changes in the School Food Environment

Schools face many obstacles when trying to incorporate healthful changes in the school cafeteria.[81] The number one barrier to effective wellness policy development, implementation and monitoring is adequate funding.[88] The second barrier is competing priorities/lack of time.[88] Lack of time can be a result of struggle from certain priorities and obligations, such as teachers contract restrictions and not having enough time in the curriculum for health, nutrition and physical education.[88] The third barrier is the need to educate and gain the support of key non-staff stakeholders.[88] It can be difficult when trying to implement change to obtain the support of students, school board members, parents and the community.[88] The last major barrier is having the necessary apparatuses to support those responsible for policy development.[88]

There has also been work in establishing local school wellness policies for schools that participate in the reimbursable meal programs that address nutrition and physical activity.[75] The USDA is helping to alleviate some of the cost issues that schools face by providing each school district up to six cents per meal if the school shows that it is meeting their standards.[81] Also, because the schools must limit their offerings of unhealthy snack options, more children will be more inclined to purchase school meals, thus increasing revenues for the school districts.[81]

Salad Bars in Schools

A salad bar can best be defined as a self-serve station where children can pick two or more fruits or vegetables.[12] Most salad bars seen in schools offer at least one vegetable with the most frequent ones being lettuce, tomatoes and other raw vegetables.[12] Most salad bars in schools, approximately 50%, also offer at least one type of fruit with the most options showing fresh fruit or canned fruit.[12]

Salad bars are being recommended as a way to address the lack of access to fruits and vegetables for children in schools.[11] Approximately one-fifth of schools offer salad bars at least one time a week.[12] The USDA has found that salad bars are most common in high schools, with 40% offering them, and least common in elementary schools, with only 14% offering them.[12] Salad bars are typically found in more affluent public NSLP schools, which means that these students are more likely to have access to fruits and vegetables in school when compared to children that attend less affluent public schools.[12]

The initial costs for salad bars are a major concern to schools; for example, it is estimated to cost about $7,000.[12] Although this price comprised of the cost of the equipment, extra food and labor costs were not included.[12] The labor costs for salad bars can be very high due to the time it takes to prep, clean, chop the food and monitor the station and area.[12] Even though the USDA is putting forth an effort to promote salad bars, there are still many individuals and corporations who are against it. For example, the advancement of salad bars took a step back a couple of years ago when the National Science Foundation issued recommendations informing elementary schools that due to the food safety concerns, self-serve salad bars should not be put into effect.[13] These bars also require monitoring by adults, which then

equates to more money being spent in order to watch the self-service salad bar.[13] In addition, salad bars lines take up a great deal of time.[13] Most students only get approximately 30 minutes for lunch[14]; therefore, if these bars are self-service, the students can take as long as they want. This can be difficult in schools with large enrollments.[13]

Studies have looked at the overall nutrition in schools and the barriers that the schools face to incorporating healthy changes.[89] Bauer et al. discovered barriers to incorporating positive changes in schools: the low nutrient foods being served and time allowed for lunch.[89] The problem with many of these barriers is that they are difficult to change. For example, the low nutrient, high fat greasy foods are cheap, easy to access and have a longer shelf life when compared to healthier food items.[89] The low nutrient foods, from either the snack carts or vending machines, are readily used by students and generate a great deal of income for schools.[89] Time limitations serve as a great barrier to eating healthy because the lines can take so long to get through.[89] Lack of time can be a result of struggles from certain priorities and obligations[88] such as instructional time that must meet requirements and time for recess.[90]

While salad bars are promoted as a way to meet the new school meal guidelines, studies have not assessed the prevalence of each of the barriers to salad bars among schools without salad bars across elementary, middle and high school levels. In addition, there are policies advocating salad bars in schools, but there is little research on the barriers that schools are confronted with when trying to put them into practice.

Summary

There have been numerous research studies that have illustrated what a profound impact that increasing fruits and vegetables has on children.[3, 91-93] It is necessary to establish the importance of fruit and vegetable intake at a young age. Children develop healthy eating patterns in childhood that are transitioned into adulthood.[61] Therefore, the ultimate goal would be for students to establish these healthful eating practices at a young age, thus staving off chronic diseases, such as diabetes, cancer and coronary heart disease, that could potentially be life threatening.[1, 16] Having a high fruit and vegetable intake can lead to many health benefits, while having a diet low in fruits and vegetables can negatively affect health outcomes. Children spend so much of their time at school, a valid reason for schools to provide healthy options for the children. It is important to consider environmental interventions in changing the school nutrition environment because research studies show it can help to increase fruit and vegetable consumption in students without classroom education.[8, 67, 68] It can be very difficult to change the school wellness policies due to the lack of funding, time, support and tools needed to increase the healthy eating patterns in schools.[75] Salad bars can assist in addressing the unavailability of fruits and vegetables for children in schools and help readily meet the requirements of the Healthy Hunger Free Kids Act.[11] However, schools all differ in their barriers to having salad bars which accounts for further research needed for future interventions that could address the barriers to implementing salad bars in schools. Research will help in distinguishing distinctive barriers across school levels that will help to guide intervention development addressing specific barriers.

CHAPTER 3

METHODS

Study Design

The study was a secondary data analysis that drew from a larger cross-sectional study used to assess the prevalence and predictors of school salad bars in Arizona. There were 1799 National School Lunch Program (NSLP) participating schools in the state during the 2013-2014 school year, which constituted the sampling frame. School nutrition managers in Arizona were contacted by email to complete the survey (see Appendix A). School-level contact information (names and emails) of school nutrition managers participating in the NSLP were initially provided by the Arizona Department of Education (ADE). District nutrition directors and schools were contacted directly for the email address of school nutrition managers if their information was not listed as contacts on the ADE. Email and phone reminders, for managers to participate, took place from April to October 2014. All schools, regardless of whether or not they had a salad bar, were invited to participate in the survey, which took approximately 5-20 minutes to complete.

For these secondary analyses, school nutrition managers who reported not currently having a salad bar were included (n=177). Excluded were surveys from schools with salad bars, and non-managers. Participants provided written consent (see Appendix A) and received a $5 gift card and an entry into a raffle for $50 or $100 gift card. The Arizona State University Institutional Review Board (IRB) approved this study (see Appendix B).

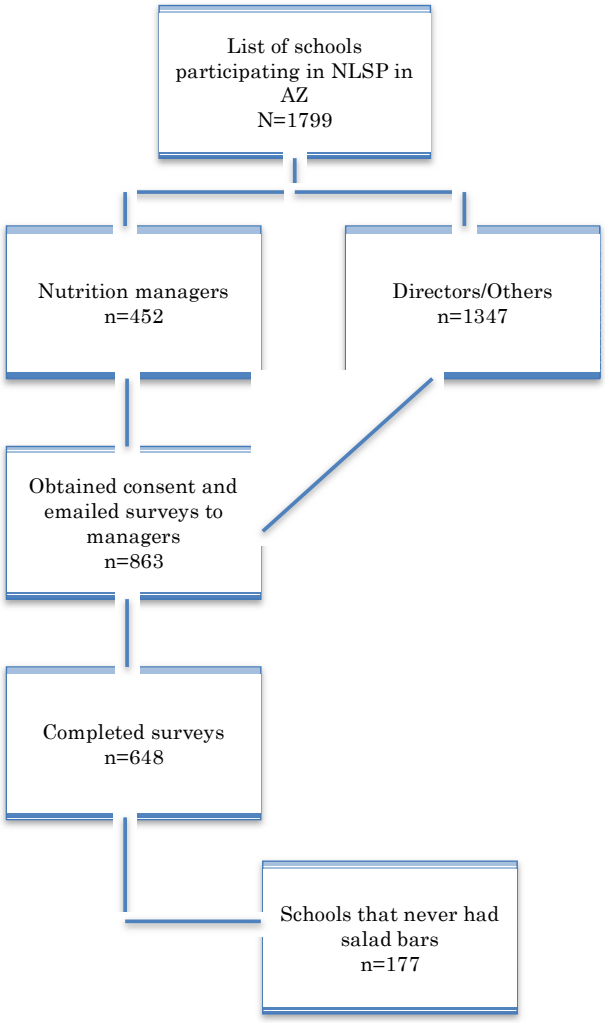


Figure 1: Flow Chart

Measures

The survey was composed of 72 questions that address issues related to salad bars in schools. The survey questions were adapted from other instruments, including the Food and Farming Foundation Salad Bar Survey, the School Nutrition

Dietary Assessment and the Arizona Department of Health Services Salad Bar Survey. The survey was finalized by consulting with experts in this field.

The independent variable examined was school level. The dependent variable being analyzed in this study would be the perceived barriers.

Salad Bar

The first survey question this study assessed identified if the school had a salad bar, asking: "Does your school currently offer a self-service salad bar (also known as produce bars, fresh fruit and vegetable bars, condiment bars, etc.) to students in your cafeteria/multipurpose room?" with potential replies of: "Yes," or "No." Only "No" respondents were included in this study.

The second survey question looked at if the school previously had a salad bar, asking: "Have you ever had a self-service salad bar (also known as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars, condiment bars, etc.) for students in your school?" with potential replies of: "Yes," or "No." Only those respondents who answered "No" were included for this study.

Perceived Barriers to Having Salad Bars

The third survey question this study assessed identified the possible barriers that schools face, posing the question: "What are the barriers to having a salad bar in your school?" with the potential replies of: "Not enough staff," "Cost of produce," "Lack of space," "Sanitation/food safety concerns," "Concern with reimbursement from federal agency," "Time to get through the lines," "Difficulty ordering fruits and vegetables" "Unsupportive administration," "Kids don't like salad bars," "Food waste

concerns," "No budget for future maintenance," "Outside Caterer/vendor," "New regulations," "Clean up concerns," and "Other". Participants could select all responses that applied to their setting.

School Level

The fourth survey question informed us of the school levels of each school. The question was a select all apply question that asked: "Which grades are in this school?" with the possible answers of: "Pre-K," "Kindergarten," "1st grade," "2nd grade," "3rd grade," "4th grade," "5th grade," "6th grade," "7th grade," "8th grade," "9th grade," "10th grade," "11th grade," and "12th grade." These school levels were then categorized into elementary (K-6th), middle (7th and 8th) and high school (9th-12th).

Covariates

In order to address several covariates that might influence the responses to some of the questions, several questions were asked on the survey. To identify if the years at the current job had any effect on the nutrition managers, an open-ended question was asked: "How many years have you been in this position?" Information regarding the other covariates being school enrollment and free-reduced eligibility rate were gleaned from the ADE website: http://www.azed.gov. A district level variable was created using ADE district code to be able to adjust for the innate clustering of schools within districts.

Statistical Analysis

Prevalence of barriers is reported as a frequency. A univariate analysis was used to determine the prevalence of barriers to having salad bars. A bivariate analysis (chi-square) was used to establish if there was a relationship between school level and the perceived barriers, and perceived barriers and the covariates. To determine differences between the barriers and school level, binominal regression models were used, adjusting for years at current job, enrollment of school, free-reduced eligibility rate and district level clustering. Analyses were conducted with Stata Statistical Software (Release 13, College Station, TX: StatCorp LP, 2013). Statistical significance was fixed at, $p<0.05$.

CHAPTER 4

DATA AND RESULTS

Descriptive Characteristics

A total of 177 school nutrition managers indicated that they did not currently have a salad bar. The proportion of respondents coming from each school level was 25% (n=45) elementary, 35.6% (n=63) middle schools and 39% (n=69) high schools (Table 1). The free/reduced eligibility rate was quite high across school levels with a mean of 70.8% (± 21.9%). The average years the school nutrition manager held their position at the school was 5.5 years ±5.8 years. The average enrollment at the schools was 508 students (±594 students). The elementary schools had the lowest average enrollment (591±264 students) and high schools had the highest average enrollment (939±918 students).

Table 1: School Demographics Among Schools Without Salad Bars (n=177)

Variables	Total n=177	Elementary	Middle	High
School Level *%(n)*				
Elementary	25.4 (45)			
Middle	35.6 (63)			
High	39.0 (69)			
Free/Reduced Eligibility Rate *mean ± SD*	70.8% ± 21.9% range: (11,98%)	63.5% ± 25.5%	66.9% ± 24.2%	61.0% ± 23.9%
Years at Current School *mean ± SD*	5.5 ± 5.8 range: (0.6,36.0)	6.7 ± 6.1	6.3 ± 5.6	6.4 ± 6.6
Enrollment at School *mean ± SD*	508 ± 594 range: (10,3201)	591 ± 264	616 ± 340	939 ±918

Unadjusted Results

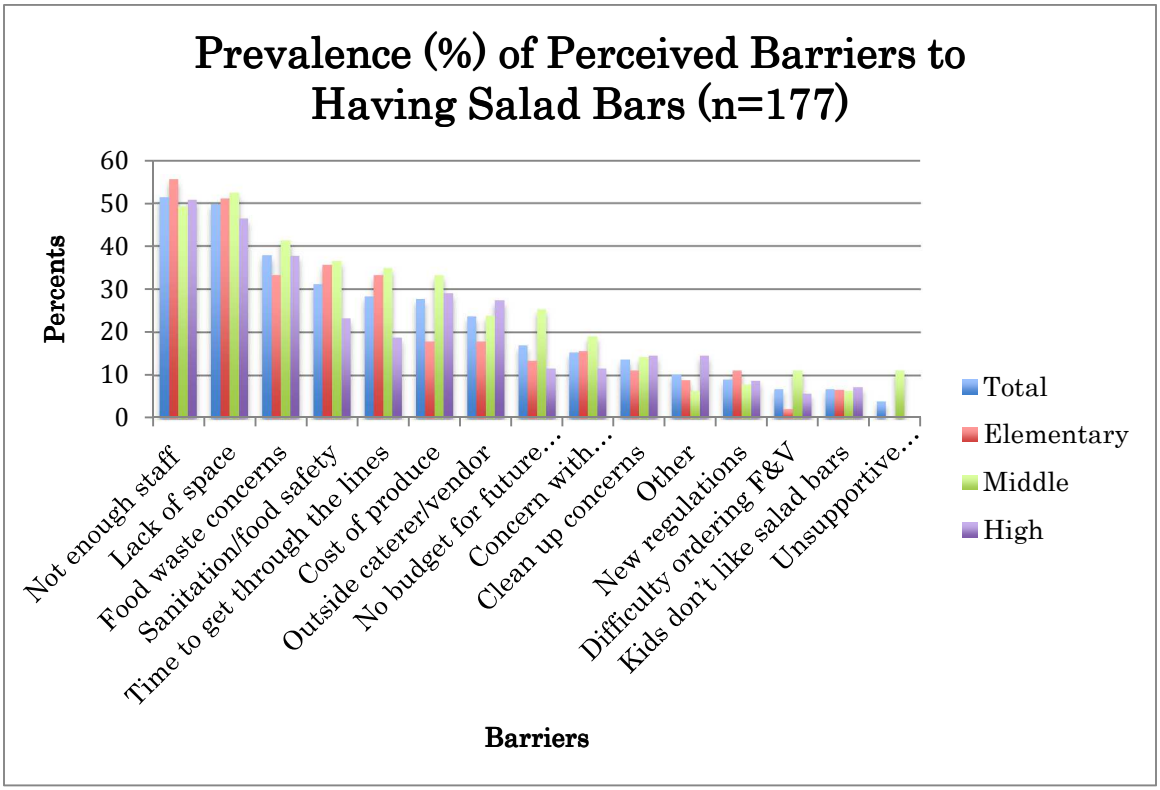
The top five barriers reported were not enough staff (51.4%), lack of space for salad bars (49.7%), food waste concerns (37.9%), sanitation/food safety concerns (31.3%), and time to get through the lines (28.3%) (Table 2 and Figure 1). The lowest barrier reported was unsupportive administration (4.0%). The results of unadjusted bivariate analyses show that these perceived barriers did not vary statistically by school level. The barrier of "No budget for future maintenance" was trending towards differing by school level; however, it was not significant ($p=0.081$) (Table 2). Middle schools reported the highest percentages of barriers, followed by elementary schools. High schools reported the least percentages of barriers to having salad bars.

Table 2: Unadjusted Prevalence (%) of Perceived Barriers to Having Salad Bars by School Level (n=177)

Barriers	Total n=177 %(n)	Elementary n=45 %(n)	Middle n=63 %(n)	High n=69 %(n)	p-value
Not enough staff	51.4 (91)	55.6 (25)	49.2 (31)	50.7 (35)	0.801
Lack of space	49.7 (88)	51.1 (23)	52.4 (33)	46.4 (32)	0.770
Food waste concerns	37.9 (67)	33.3 (15)	41.3 (26)	37.7 (26)	0.703
Sanitation/food safety	31.3 (55)	35.6 (16)	36.5 (23)	23.3 (16)	0.193
Time to get through the lines	28.3 (50)	33.3 (15)	34.9 (22)	18.8 (13)	0.083
Cost of Produce	27.7 (49)	17.8 (8)	33.3 (21)	29.0 (20)	0.195
Outside caterer/vendor	23.7 (42)	17.8 (8)	23.8 (15)	27.5 (19)	0.488
No budget for future maintenance	17.0 (30)	13.3 (6)	25.4 (16)	11.6 (8)	0.081
Concern with reimbursement	15.3 (27)	15.6 (7)	19.1 (12)	11.6 (8)	0.492
Clean up concerns	13.6 (24)	11.1 (5)	14.3 (9)	14.5 (10)	0.857
Other	10.2 (18)	8.9 (4)	6.4 (4)	14.5 (10)	0.287
New regulations	9.0 (16)	11.1 (5)	7.9 (5)	8.7 (6)	0.845
Difficulty ordering F&V	6.8 (12)	2.2 (1)	11.1 (7)	5.8 (4)	0.178
Kid's don't like salad bars	6.8 (12)	6.7 (3)	6.4 (4)	7.3 (5)	0.979
Unsupportive administration	4.0 (7)	0.0 (0)	11.1 (7)	0.0 (0)	N/A

Bivariate analysis, using chi-square tests, 97.7% report at least one barrier 97.7 (173)

Figure 1: Prevalence (%) of Perceived Barriers to Having Salad Bars by School Level (n=177)



Adjusted Results

After adjustments, there were two significant differences between barriers and school level (Table 3). There were differences in time to get through lines ($p=0.040$) and outside caterer/vendor ($p=0.018$). The barrier time to get through lines was reported more often by elementary schools and middle schools and less often by high schools. The barrier of having an outside caterer/vendor was reported increased by school level with elementary school nutrition managers reporting least often and high schools reporting this barrier the most often. No other perceived barriers differed by school level.

Table 3: Adjusted Predicted Probabilities and 95% CI of Perceived Barriers to Having Salad Bars by School Level (n=155)*

Barriers	Elementary n=45 % (95% CI)	Middle n=63 % (95% CI)	High n=69 % (95% CI)	p-value
Not enough staff	58.6 (43.8, 73.3)	47.4 (33.7, 61.1)	47.0 (34.0, 60.0)	0.527
Cost of produce	18.7 (6.93, 30.5)	31.7 (18.9, 44.6)	30.7 (18.4, 43.0)	0.210
Lack of space	52.9 (37.8, 68.0)	50.4 (36.5, 64.2)	43.4 (30.2, 56.5)	0.357
Sanitation/food safety	33.4 (19.5, 47.3)	43.4 (30.3, 56.5)	21.0 (10.8, 31.0)	0.164
Concern with reimbursement	19.3 (7.1, 31.4)	24.0 (12.3, 35.7)	7.5 (1.2, 13.9)	0.135
Time to get through the lines	36.1 (21.5, 50.7)	36.8 (23.2, 50.4)	16.5 (7.0, 26.1)	0.040
Difficulty ordering F&V	2.1 (-2.0, 6.1)	11.3 (3.8, 18.8)	6.6 (-0.3, 13.5)	0.440
Unsupportive administration	--	--	--	N/A
Kids don't like salad bars	7.1 (-0.6, 14.8)	4.9 (-0.6, 10.4)	7.7 (0.4, 15.1)	0.885
Food waste concerns	33.1 (19.1, 47.2)	43.2 (29.8, 56.7)	38.7 (26.1, 51.3)	0.601
No budget for future maintenance	10.7 (1.8, 19.6)	21.9 (10.8, 33.0)	13.1 (4.0, 22.2)	0.782
Outside caterer/vendor	14.8 (6.2, 23.3)	24.1 (14.7, 33.6)	31.6 (22.2, 41.0)	0.018
New regulations	10.3 (1.5, 19.1)	10.7 (2.2, 19.3)	8.4 (1.4, 15.4)	0.736
Clean up concerns	9.5 (0.5, 18.4)	16.3 (5.9, 26.8)	14.1 (5.1, 23.0)	0.541
Other	10.4 (1.7, 19.0)	5.3 (0.5, 10.1)	18.4 (9.2, 27.5)	0.196

Adjusted binominal regression analysis, by years at current job, enrollment of school, free/reduced rate and clustering
*Sample size varies due to missing information in the covariates

CHAPTER 5

DISCUSSION

The purpose of this secondary data analysis was to assess the prevalence of barriers to school salad bars in Arizona and to determine if those barriers varied across school level. There have been numerous studies conducted assessing how salad bars led to increased fruit and vegetable intake in children; however, there have not been any studies done that examine the prevalence of specific barriers to salad bars among schools without salad bars across school level. The current study found that the top barriers to having salad bars regardless of school level were not enough staff, lack of space for salad bars, food waste concerns, sanitation/food safety concerns and time to get through the lines. The preliminary data in this study demonstrates that schools differ significantly by school level for two of the 15 barriers assessed: having an outside vendor/caterer for their meal program and time to get through the service lines. The present findings can help lead interventions in the implementation of school salad bars. Understanding the barriers to school salad bars will help make it possible for schools to gain support in establishing salad bars and allow food service authorities to recognize potential barriers that school nutrition managers may encounter.

The first research question asked was, "What is the primary perceived barrier to not having a salad bar? "The hypothesis to this question was, "The primary perceived barrier to not having a salad bar will be no budget for future maintenance." The results prove that this hypothesis will not be accepted. The results show that the primary perceived barrier to not having salad bars was due to

not having enough staff. Out of the 15 barriers, no budget for future maintenance was ranked as number seven.

USDA examined barriers to increasing salad bars in schools, finding that most barriers were related to financial concerns.[12] Cost related issues could be related to the barriers used in this study such as: not enough staff, food waste concerns, cost of produce, no budget for future maintenance and concern with reimbursement. The barriers not enough staff and food waste concerns were the top two barriers schools selected in this study. This suggests that the USDA's findings were similar to this study's findings and that cost related issues could be major barriers when trying to implement salad bars. It is estimated to cost around $7,000 to input salad bars in schools.[12] This price includes the cost of the equipment but does not include the extra food and labor costs.[12] Cost related issues involving not having enough staff could be from not being able to pay someone to prep, clean, chop the food and monitor the station.[12] The USDA has made efforts to help alleviate some of the cost issues associated with salad bars by providing the school districts up to six cents per meal if a school shows that it is meeting the standards.[81] Results from this study indicate that middle schools have the highest concerns with reimbursement, followed by elementary schools and high schools. Concerns with reimbursement could be relating to serving portions; for example, kids being able to select their own portions for salad bars and some portions may not meet all requirements.[12] The School Nutrition Dietary Assessment-II (SNDA-II) reported that salad bars meet the RDA nutrients but do not meet the National School Lunch Program standards for fat, saturated fat and sodium, which could be due to the portion sizes not being predetermined.[12] More research is needed to assess the

financial and economic implications to implementing school salad bars. There will need to be specific duties assigned when implementing salad bars. For example, according to USDA guidance on salad bars, it is necessary to have someone monitor food items that students select in order for items on the salad bar to be counted towards the reimbursable meal. In addition, it will be beneficial to have someone to encourage students to select a variety of food items in order to meet requirements for reimbursable meals. From these results, more staff may be needed when trying to implement salad bars in schools.

The second research question for this thesis examined if perceived barriers to not having a salad bar differed according to school level. The hypothesis to this question was that the perceived barrier to not having salad bars will not differ across school level. This hypothesis will also be rejected because the findings show that there is a significant difference between school level for the barriers outside caterer/vendors and time to get through the lines.

Most of the barriers that we assessed did not differ by school level. The implications of none of these factors being related to school level would be that all of the barriers listed above need to be considered when trying to establish salad bars in schools that have never had salad bars regardless of school level. This finding indicates that interventions do not need to be segmented; they can be uniform across school level with exceptions of the two barriers that we found differences for: time to get through the service lines and having outside vendors/caterers for their meal programs.

Managers overseeing middle and elementary schools were similar in their reports of concerns of the salad bar contributing to time to get through the line; high

schools reported this barrier 20% points lower. Average lunch period for all school levels is approximately 30 minutes.[14] A study conducted on elementary, middle and high schools in Massachusetts showed that the average lunch time for elementary was 25.4 minutes, middle was 26.2 minutes and high school was 26.3 minutes.[90] In addition, this study found that the most common barriers to increasing the lunch period was due to time needed for learning.[90] It can be difficult to extend the time allotted for lunch due to competing priorities and obligations[88] such as instructional time that must meet requirements and time for recess.[90] Generally, time for lunch tends to not be under the control of the manager; therefore, it is challenging for them to accommodate extra time in self-service lines. It can be especially difficult to get through the lines in largely populated schools.[13] Results may reflect the concern that nutrition managers have with the time that it takes for younger children to make their selections in the lunch line. More research is needed to determine if the barrier time to get through the lunch lines is due to the middle and elementary school students taking more time to select their food items or if it is due to the enrollment size of the lunch period. In addition, research will be useful to determine exactly how long students take to go through salad bar lines. Further research is needed to understand if salad bars add to the time it takes for students to get through the lines.

The barrier having outside vendors or caterers was reported the highest by high school nutrition managers. It can be difficult for school nutrition managers to control what is offered during lunch because the caterers and vendors automatically determine the menu and what is being serving. However, outside vendors or caterers might be willing to place salad bars in schools for which they cater.

The National Science Foundation recommends limiting elementary schools to not have salad bars due to the food safety and sanitation concerns with children putting their unwashed hands in the different food items.[13] However, the results from this study show that elementary schools actually do not have the highest food safety/sanitation concerns, but instead middle school nutrition managers report this barrier at the highest rate (but not statistically significant). Middle schools reported this concern 10% points higher than elementary schools. More research is needed to understand why middle school nutrition managers have the most food safety and sanitation concerns regarding salad bars.

Strengths and Weaknesses

Strengths and weakness of this study will be taken into account when understanding the outcomes. This is the first study to assess barriers related to salad bars. An additional strength to this study was that school level factors were reported at the school level. Another strength of this study was that elementary, middle and high school levels were included; whereas, most other studies on salad bars have focused solely on elementary schools alone. In addition, this study had a very high response rate. One of the main weaknesses to this study was that it was a cross-sectional study. This indicates that causal relationship between dependent and independent variables may not be made. In addition, this study was a convenience sample of the schools in Arizona; therefore, it may not be a good depiction of all schools barriers to having salad bars in Arizona or even across the U.S. Finally, there were specific confounders not controlled for that need to be considered such as: race/ethnicity, gender and age of the respondents.

Summary

This was the first study to assess the prevalence of barriers to salad bars among schools without salad bars across school level. The results from this study indicate that the top barrier schools face when trying to implement salad bars is not having enough staff. In addition, the results showed that schools differ significantly for the two barriers having an outside vendor/caterer for their meal program and time to get through the service lines. High schools report a higher percent of the barrier outside caterer/vendors when compared to elementary and middle schools. Elementary and middle schools report a higher percent of the barrier time to get through the lines when compared to high schools. The results from this study will assist in leading interventions in the implementation of salad bars.

CHAPTER 6

CONCLUSION

Salad bars are being recommended as a way to address the lack of access to fruits and vegetables for children in schools.[11] However, there is very little known about salad bars in schools. This study assessed the prevalence of barriers to school salad bars in Arizona and determined if those barriers varied across school level. This thesis identified unique barriers, specific to school level that schools face when trying to implement salad bars.

None of the hypotheses for this study were upheld. The primary perceived barrier by school nutrition managers to not having a salad bar was related to not having enough staff. The barrier hypothesized to be the primary perceived barrier to not having a salad bar was no budget for future maintenance. It was also hypothesized that the perceived barriers to not having a salad bar would not differ significantly across school level. However, this hypothesis was not upheld because two of the 15 barriers differed significantly across school level: having an outside vendor/caterer for their meal program and time to get through the service lines.

More research is needed to assess the financial and economic implications to implementing school salad bars. For instance, it will be necessary to determine how much it will cost to start up a salad bar and maintain it. This would include the cost needed to prep, monitor, clean and chop the station. It will also be necessary to conduct more research in order to make sure the salad bar can meet the requirements for reimbursable meals.

In addition to financial research on salad bars, it will be important to determine the approximate time it takes students to get through salad bar lines and if this adds to the time it takes for students to get through the lines. Since the barrier time to get through the service lines was a concern with middle and elementary school nutrition managers, more research is needed to determine if the barrier time to get through the service lines is due to the younger students taking more time to select their food items or if it is due to the enrollment size of the lunch period. Future research interventions could also look at why middle school nutrition managers have the most food safety and sanitation concerns regarding salad bars when most of the literature says that elementary schools do.

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APPENDIX A

CONSENT FORM AND SURVEY

Dear School Nutrition Manager,

We need your help today. Arizona State University invites you to participate in an online survey on the use of school lunch salad bars in Arizona. Schools with and without salad bars are invited to participate. Your school was randomly selected for this important survey along with about half of all schools in Arizona.

Details of participation from school nutrition managers:

- The survey should take only 20 minutes and you may save and continue at any time.
- Participants will receive a $5 online gift card to Amazon or Target (your choice) for participation after completing the survey.
- Participants will be entered into a drawing for the chance at six $50 and two $100 gift cards!
- You can choose not to participate or to opt-out of the survey at any time, there is no penalty.
- All information you provide today will be kept **confidential**. Your name and other uniquely identifying information will never be published or associated with your answers in any way. Your responses (in aggregate) will be used to help develop the guidance on the use of salad bars in Arizona.

Participating in this study will not impact your job in any way. There are no foreseeable risks for your participation in the research. There may be no direct benefit to you from participating in the research. Your participation is greatly appreciated!

If you have any questions concerning the research study, please call Drs. Marc Adams or Meg Bruening at 602-827-2266 or email us at asu.saladbar@gmail.com If you have any questions about your rights as a subject/participant in this research, or is you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, though the Office of Research Integrity and Assurance, at 480-965-6788.

Are you willing to participate in this survey?

✎ Yes (1)

1. What is the full name of the school that you work at?
   _____

2. What is your school's zip code? _____

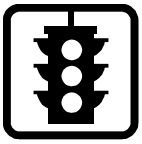
3. Which grades are in this school? (Please select all that apply)
   - □ pre-k (1)
   - □ Kindergarten (2)
   - □ 1st grade (3)
   - □ 2nd grade (4)
   - □ 3rd grade (5)
   - □ 4th grade (6)
   - □ 5th grade (7)
   - □ 6th grade (8)
   - □ 7th grade (9)
   - □ 8th grade (10)
   - □ 9th grade (11)
   - □ 10th grade (12)
   - □ 11th grade (13)
   - □ 12th grade (14)

4. What is your position at the school?
   - □ School Nutrition Manager (1)
   - □ Kitchen staff (2)
   - □ District Food Service Director (3)
   - □ Other: (4) _____

5. How many years have you been in this position at this school? (Please round up to the nearest whole year; e.g., 11.3 years of service=12) _____

6. Most often, which of the following would you call the bar that serves fresh and/or canned produce to students?
   - □ Salad bar (1)
   - □ Produce bar (2)
   - □ Fresh fruit and vegetable bar (3)
   - □ Condiment bar (4)
   - □ Other. Please specify: (5) _____

7. Does your school currently offer a self-service salad bar (also known as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars, condiment bars, etc) to students in your cafeteria/multipurpose room?



   - □ Yes (1) ✂ If yes, please skip to page 8, question #18
   - □ No (2) ✂ If no, please continue

8. Have you ever had a self-service salad bar (also known as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars, condiment bars, etc) for students in your school?
   - □ Yes (1)✂ If yes, please continue
   - □ No (2)✂ If no, please skip to page 5, item #13

9. When did you stop providing a salad bar?
   - □ Within the past year (1)
   - □ Within the past 5 years (2)
   - □ Within the past 10 years (3)
   - □ More than 10 years ago (4)

10. What contributed to you discontinuing your salad bar? (Please select all that apply)
   - □ Not enough staff (1)
   - □ Cost of produce (2)
   - □ Lack of space (3)
   - □ Sanitation/food safety concerns (4)
   - □ Concern with reimbursement from federal agency (5)
   - □ Time to get through the lines (6)
   - □ Difficulty ordering fruits and vegetables (7)
   - □ Unsupportive administration (8)
   - □ Kids don't like salad bars (9)
   - □ Food waste concerns (10)
   - □ No budget for future maintenance (11)
   - □ Outside caterer/vendor (12)
   - □ New USDA regulations (13)
   - □ Clean up concerns (14)
   - □ Other. Please specify: (15) _____

11. Did your school ever use any of the practices listed below to specifically promote your salad bars? (Please select all that apply)
    - □ Posters (1)
    - □ Morning announcements/promotions (2)
    - □ Multimedia (3)
    - □ Newsletters/Parent folders (4)
    - □ School website (5)
    - □ Classroom education (6)
    - □ Carrot chasers (7)
    - □ Fruit and Vegetable of the day (8)
    - □ Match salad bar offerings to the entree (e.g., jalapenos, diced tomatoes, cabbage, etc. when serving Mexican food) (9)
    - □ Change meal tray color (10)
    - □ Other. Please specify (11) _____

12. Did you use any of the following methods to educate and engage parents about your salad bar? (Please select all that apply)
    - □ We invited parents to lunch (1)
    - □ We sent letters and/or emails to parents specifically about the meal program (2)
    - □ We included fruit and vegetable information on the school website (3)
    - □ We invited parent volunteers in the cafeteria (4)
    - □ We presented our meal program at parent meetings (5)
    - □ We had a video about our program and made it available for viewing on our department home page (6)
    - □ We actively used social media (Facebook, Twitter, etc) to engage parents about our meal program (7)
    - □ We created print materials specifically targeting parents to educate them about our programs (8)
    - □ Other. Please specify: (9) _____

13. What are the barriers to having a salad bar in your school? (Please check all that apply)

- □ Not enough staff (1)
- □ Cost of produce (2)
- □ Lack of space (3)
- □ Sanitation/food safety concerns (4)
- □ Concern with reimbursement from federal agency (5)
- □ Time to get through the lines (6)
- □ Difficulty ordering fruits and vegetables (7)
- □ Unsupportive administration (8)
- □ Kids don't like salad bars (9)
- □ Food waste concerns (10)
- □ No budget for future maintenance (11)
- □ Outside Caterer/vendor (12)
- □ New regulations (13)
- □ Clean up concerns (14)
- □ Other. Please specify: (15) _____

14. What is your personal view about the effectiveness of salad bars in schools to promote fruit and vegetable consumption?

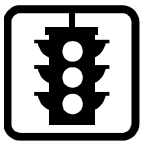
- Very Positive (1)
- Positive (2)
- Neutral (3)
- Negative (4)
- Very Negative (5)

15. Please select the top 3 resources that might be helpful to you to offer a salad bar in your school.

- Training and conference sessions (1)
- E-mail blast newsletters (2)
- Sharing listserv (3)
- Blog (4)
- Facebook (5)
- Funding (6)
- Support from School Administration (7)
- Other (please specify) (8) _____

16. Have you ever applied for funding for salad bars (also known as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars, condiment bars, etc) in your school?
   - Yes (1)
   - No (2)

17. If yes, what sources of funding have you pursued for salad bars (also known as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars, condiment bars, etc)?
   - Federal Grant (e.g., USDA equipment grant) (1)
   - Let's Move Salad Bars to Schools grant (2)
   - State grant (3)
   - Parent fundraising (4)
   - Fuel Up to Play 60 (5)
   - Other, please specify (6) _____



Please skip to page 19, item #51

18. Approximately how many years have you provided the self-serve salad bar to students?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)
- 11 (11)
- 12 (12)
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- 28 (28)
- 29 (29)
- 30 (30)
- 31 (31)
- 32 (32)
- 33 (33)
- 34 (34)
- 35 (35)
- 36 (36)
- 37 (37)
- 38 (38)
- 39 (39)
- 40+ (40)

19. How many days per week does your school use self-serve salad bars for students at lunch?
- 1
- 2
- 3
- 4
- 5

20. How many salad bars (also known as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars, condiment bars, etc) do you currently use in your cafeteria for students?
- 1
- 2
- 3
- 4 or more

21. What height salad bars (also known as produce bars, fresh fruit and vegetable bars, fruit and vegetable bars, condiment bars, etc) are currently operating in your school?
- Low-height bar(s) (1)
- Standard-height bar(s) (2)
- Other. Please specify: (3) _____
- Don't know (4)

22. Is the salad bar located within or outside of the serving line?
    - ✂ Within the serving line (1)
    - ✂ Outside of the serving line (2)

    If Outside of the serving line Is Selected, Then Skip to #24

23. Is the salad bar located at the beginning, middle or end of the line?
    - ✎ Beginning (1)
    - ✎ Middle (2)
    - ✎ End (3)

24. Is your self-service salad bar included _____? (Please select all that apply)
    - ✂ As part of the reimbursable meal (1)
    - ✂ As a complete reimbursable meal (2)
    - ✂ As a la carte items (3)
    - ✂ Other. Please specify: (4) _____

25. Is the self-service salad bar used in any of the following ways? (Please check all that apply)
    - ✂ Breakfast bar (1)
    - ✂ Grab and go breakfast (2)
    - ✂ Snacks (3)
    - ✂ Specialty bar (taco, potato, etc) (4)
    - ✂ Other (5) _____

26. In the past year, has your salad bar ever included... (Please select all that apply)
    - ✂ Fresh whole fruit (1)
    - ✂ Fresh cut fruit (2)
    - ✂ Canned fruit (3)
    - ✂ Fresh vegetables (4)
    - ✂ Pickled or canned vegetables (5)
    - ✂ Spinach (6)
    - ✂ Leaf Lettuce (as opposed to iceberg lettuce) (7)
    - ✂ Beans/legumes (8)

27. In the past year, has your salad bar ever included… (Please select all that apply)
- ✂ Salads with salad dressing/mayonnaise/dairy or non-dairy whip (e.g., pasta salad, potato salad, etc) (1)
- ✂ Legume/bean salad (may be made with salad dressing) (2)
- ✂ Pudding/gelatin/dessert salads (3)
- ✂ Peanut butter (4)
- ✂ Dairy products (e.g., cheeses, yogurt, cottage cheese) (5)
- ✂ Breads and crackers (6)
- ✂ Toppings (e.g., croutons, nuts/seeds, bacon bits, etc) (7)
- ✂ Other, please specify (8) _____

28. Please select the top 5 most popular fruit items on your salad bar(Write 1, 2, 3, 4, or 5 in the appropriate box)

_____ Apples (1)
_____ Strawberries (2)
_____ Bananas (3)
_____ Kiwis (4)
_____ Oranges (5)
_____ Pineapple (6)
_____ Grapes (7)
_____ Watermelon (8)
_____ Blueberries (9)
_____ Mangoes (10)
_____ Other. Please specify: (11)

29. Please identify the top 5 most popular vegetable items on your school's salad bar. (Write 1, 2, 3, 4, or 5 in the appropriate box)

_____ Tomatoes (1)
_____ Cucumber (2)
_____ Bell pepper (3)
_____ Squash (4)
_____ Carrots (5)
_____ Celery (6)
_____ Lettuce (7)
_____ Spinach (8)
_____ Onions (9)
_____ Broccoli (10)
_____ Beans/legumes (11)
_____ Other. Please specify: (12)

30. How often do you serve the following items on the salad bar?

	Daily (1)	2-3 Times a Week (2)	Once a Week (3)	2-3 Times a Month (4)
Cut fruit (1)	✎	✎	✎	✎
Whole fruit (2)	✎	✎	✎	✎
Cut vegetables (3)	✎	✎	✎	✎
Canned fruit and/or vegetables (4)	✎	✎	✎	✎
Prepared salads (5)	✎	✎	✎	✎

31. How often do you rotate salad bar options to increase variety?
    - ✎ Daily (1)
    - ✎ 2-3 Times a Week (2)
    - ✎ Weekly (3)
    - ✎ Monthly (4)
    - ✎ Seasonally (5)
    - ✎ School Quarter (6)
    - ✎ We don't rotate our salad bar options (7)

32. Has ordering fruits and vegetables increased as a result of implementing salad bars in your school?
    - Yes (1)
    - No (2)
    - Don't know (3)

33. Which sources do you use to stock your salad bar? (Please select all that apply)
    - USDA Foods (formerly known as the Commodity Program) (1)
    - Local farmers (2)
    - School gardens (3)
    - DOD Fresh Fruit and Vegetable Program (4)
    - Vendor/usual distributor (5)
    - Other, please specify (6) _____

34. Has your school added refrigeration and/or freezer space since implementing your salad bar?
    - Yes (1)
    - No (2)

35. Has your school added dry storage space since implementing your salad bar?
    - Yes (1)
    - No (2)

36. How was the salad bar equipment funded at this school?
    - Federal grant (e.g., USDA equipment grant) (1)
    - Let's Move Salad Bars to Schools grant (2)
    - State grant (3)
    - Parent fundraising (4)
    - Other, please specify (5) _____

37. How is the salad bar monitored during service?
- Staff member dedicated to monitor the bar (1)
- Cashier monitors the bar (2)
- No monitor (3)
- Other, please specify: (4) _____

38. Does your school use salad bars to increase calories on the line? (e.g., with dressing, cheese, peanut butter, protein, bread)
- Yes (1)
- No (2)
- Don't know (3)

39. How often does your school use prepackaged items on your self-serve salad bar for students?
- Every day (1)
- 3-4 times per week (2)
- 1-2 times per week (3)
-

40. What are barriers to schools using prepackaged items on self-serve salad bars for students?
- Cost concerns (1)
- Sanitation concerns (2)
- Increased staffing (3)
- Other. Please specify: (4) _____

41. Where is the salad dressing located in your cafeteria?
- Outside of the serving line (1)
- Within the serving line (2)
- We don't serve salad dressing (3)

42. Does your school use any of the practices listed below to specifically promote your salad bars? (Please select all that apply)
    - ✂ Posters (1)
    - ✂ Morning announcements/promotions (2)
    - ✂ Multimedia (3)
    - ✂ Newsletters/Parent folders (4)
    - ✂ School website (5)
    - ✂ Classroom education (6)
    - ✂ Carrot chasers (7)
    - ✂ Fruit and vegetable of the day (8)
    - ✂ Match salad bar offerings to the entre (ex...jalepenos, diced tomatoes, cabbage, etc... when serving Mexican food) (9)
    - ✂ Change meal tray color (10)
    - ✂ Other, please specify (11) _____
    - ✂ None of the above (12)

43. Are you using any of the following methods to educate and engage parents about your salad bar? (Please select all that apply)
    - ✂ We invite parents to lunch (1)
    - ✂ We send letters and/or emails to parents specifically about the meal program (2)
    - ✂ We include fruit and vegetable information on the school website (3)
    - ✂ We invite parent volunteers in the cafeteria (4)
    - ✂ We present our meal program at parent meetings (5)
    - ✂ We have a video about our program and have made it available for viewing on our department home page (6)
    - ✂ We actively use social media (Facebook, Twitter, etc) to engage parents about our meal program (7)
    - ✂ We created print materials specifically targeting parents to educated them about our programs (8)
    - ✂ Other. Please specify: (9) _____

44. In your best estimate, what has been the change in participation in your school lunch program since you implemented the salad bar?
    - Increased by >20%
    - Increased by 10-19%
    - Increased by 1-9%
    - Did not change
    - Decreased by 1-9%
    - Decreased by 10-19%
    - Decreased by >20%

45. In your best estimate, based on sales and meal counts, have student purchases of competitive foods changed since implementation of the salad bar?
    - Yes (1)
    - No (2)

46. In your best estimate, plate waste has_____ since implementing a salad bar at your school?
    - Increased (1)
    - Decreased (2)
    - Stayed the same (3)
    - I don't know (4)

Keep going, you're almost there…

47. What have been challenges for your school in implementing a salad bar? (Please select all that apply)
    - ✂ Not enough staff (1)
    - ✂ Cost of produce (2)
    - ✂ Lack of space (3)
    - ✂ Sanitation/food safety concerns (4)
    - ✂ Concern with reimbursement from federal agency (5)
    - ✂ Time to get through the lines (6)
    - ✂ Difficulty procuring fruits and vegetables (7)
    - ✂ Unsupportive administration (8)
    - ✂ Kids don't like salad bars (9)
    - ✂ Food waste concerns (10)
    - ✂ Children self-serving themselves (11)
    - ✂ No budget for future maintenance (12)
    - ✂ Outside Caterer/vendor (13)
    - ✂ Other. Please specify: (14) _____
    - ✂ None of the above (15)

48. Please rank the top 3 types of information or resources would be helpful to you to offer a salad bar? (Write 1, 2, or 3 in the appropriate box)
    _____ Training and conference sessions (1)
    _____ E-mail blast newsletters (2)
    _____ Sharing listserv (3)
    _____ Blog (4)
    _____ Facebook (5)
    _____ Funding (6)
    _____ Other (please specify) (7)

49. Over the course of the program, please indicate how support from the following groups has changed, if at all, in regard to the salad bar

	Less Supportive (1)	Same amount of support (2)	More supportive (3)	Unsure (4)	N/A (5)
Administration (1)	✎	✎	✎	✎	✎
Teachers and staff (2)	✎	✎	✎	✎	✎
Parents (3)	✎	✎	✎	✎	✎
Kitchen staff (4)	✎	✎	✎	✎	✎
Students (5)	✎	✎	✎	✎	✎

50. What is your personal view about salad bars in schools?
- ✎ Very Positive (1)
- ✎ Positive (2)
- ✎ Neutral (3)
- ✎ Negative (4)
- ✎ Very Negative (5)

Just a few more questions about your school….

51. On average, how many days do you serve lunch to students each week?
    - 1
    - 2
    - 3
    - 4
    - 5

52. On most days, how many lunch periods are there at your school?_____

53. On average, what is the length of a lunch period (in minutes) for students at your school?

    _____minutes

54. Are lunch periods organized by grade or are they periods made up of mixed grades?
    - Organized by grade (1)
    - Multiple grades in each period (2)
    - Some periods include students in multiple grades, while others have single grade only (3)

55. Does recess/free recreational time time occur...
    - Before lunch (1)
    - After lunch (2)
    - Varies by lunch period or grade level (3)
    - We don't have recess/free recreational time for students (4)

56. Which of the following kitchen facilities are in use at your school?
    - Full-service kitchen (i.e., ovens, refrigerators, stove) (1)
    - Partial-kitchen (i.e., warming oven or microwave only) (2)
    - No kitchen (3)

57. At what level are decisions about menus and food service made? (Please select all that apply)
    - At the school level (1)
    - At the district level (2)
    - Contracted menu planner (3)
    - Caterer (4)
    - Food service management contractor (5)
    - Other. Please describe: (6) _____

58. Please indicate whether the following staff work at your school (including staff shared among multiple schools in your district)

	No (1)	Yes (FULL-TIME) (2)	Yes (PART-TIME) (3)
Physical education coordinator (1)	✎	✎	✎
Physical activity teacher (2)	✎	✎	✎
Food service coordinator (3)	✎	✎	✎
Dietitian/ nutritionist (4)	✎	✎	✎
Health educator (dedicated specifically to health issues) (5)	✎	✎	✎

59. Does your school have an a la carte line with items available for purchase during lunch for students? If a la carte options and offerings vary, please think about the majority of time.
    - ✎ Yes (1)
    - ✎ No (2)

60. Are reimbursable meals or items available for purchase on your a la carte line (in addition to a la carte items)?
    - ✎ Yes, BOTH reimbursable meals and items (1)
    - ✎ Yes, only reimbursable meals (2)
    - ✎ Yes, only reimbursable items (3)
    - ✎ No (4)

61. Where is the location of the a la carte items available for purchase during lunch?
    - ✂ Inside the main lunch line (1)
    - ✂ Outside the main lunch line (2)

Please confirm that you would like to receive a $5 gift card.

- No, thank you. I do not want a gift card. (1)
- Yes. Please email me a $5 gift card from Amazon. (2)
- Yes. Please send me a $5 gift card from Target. (3)

Thank you so much for taking the time to complete this survey! Please provide us with your email, cell phone number, or address so that we can send you your thank you $5 gift card.

Email: _____

Cell Phone (Target gift cards only):_____

Address: _____

_____

(Only for schools with salad bars)

If you send us a picture of your salad bar, you will automatically have another entry into the drawing for $50 and $100. Is this something you are willing to do?

- No. (1)
- Yes (2)✂Great, please send us your salad bar picture to asu.saladbar@gmail.com.

Thank you so much for your time!

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL

Instructions and Notes:
- Depending on the nature of what you are doing, some sections may not be applicable to your research. If so, mark as "NA".
- When you write a protocol, keep an electronic copy. You will need a copy if it is necessary to make changes.

1 **Protocol Title**
Include the full protocol title: Assessment of Salad Bars in Arizona Schools

2 **Background and Objectives**
Provide the scientific or scholarly background for, rationale for, and significance of the research based on the existing literature and how will it add to existing knowledge.
- Describe the purpose of the study.
- Describe any relevant preliminary data.

The United States Department of Agriculture (USDA) recently released new guidance for NSLP based on the 2010 Healthy, Hunger-Free Kids Act that required schools to offer greater variety of F&V and also specified minimum amounts students must take.

School salad bars have become a preferred strategy to increase F&V variety and consumption across the nation and have been promoted with the support of national initiatives such as Let's Move Salad Bars to Schools (LMSBS). However, no rigorous prevalence estimates of school salad bars exist for AZ or nationally especially since changes to the NSLP guidelines and LMSBS initiative. The CDC acknowledges that research around salad bars and students' diet is "very limited" even in the context of rapid promotion. Furthermore, research is needed to understand the school and student level factors that are associated with F&V consumption and waste at school salad bars in order to make them more efficient and effective.

The aim of our salad bar survey is measure the prevalence of salad bars at AZ public elementary and secondary schools participating in the NSLP and examine whether presence/absence of bars it related to various school-level factors (e.g. rural vs. urban, dietician on staff) in a cross-sectional study. HYPOTHESIS: The absence of bars will be significantly related to several school-level factors, such as staff and school type.

A cross-sectional survey will be conducted with school nutrition managers in AZ NSLP- participating public and elementary schools. An online survey designed by the investigators in collaboration with the AZ DOE, DHS and the CDC will elicit the prevalence of salad bars and assess associated school-level factors such as school grade level, NSLP participation rates, % free/reduced eligibility, rural vs. urban, and practices that support salad bars (location of salad bar, years since introduction, nutrition education and promotion, presence of a district or school dietician, participation in other programs) and barriers such as finances, time, and sanitation concerns. Respondents also will e asked to submit a photo of the school salad bar for research staff to verify items variety and classify type of bar. Participants will be given an incentive for completing the survey. Each school nutrition manager who completes the online survey will receive a $5 online gift card to Amazon or Target for their participation. We understand that this incentive amount is relatively small, so in addition to the $5 gift card, participants will be entered into a drawing for the chance at $100 (n=2) and $50 (n=6) gift cards. AZ DOE has offered to provide a list of 2242 NSLP-participating schools in the state (see attached letters of support), which will constitute our sampling frame. We plan to randomly sample 1068 schools (47.6%) which will allow for a precise prevalence estimate with a 95% confidence interval of +/- 3 points, given an alpha=0.05 and 80% power. With a sample of 1068 schools, we could also detect a Pearson correlation as small as 0.086 with an alpha=0.05 and 80% power.

3 **Inclusion and Exclusion Criteria**

Describe the criteria that define who will be included or excluded in your final study sample. If you are conducting data analysis only describe what is included in the dataset you propose to use.

Indicate specifically whether you will target or exclude each of the following special populations:

- Minors (individuals who are under the age of 18)
- Adults who are unable to consent
- Pregnant women
- Prisoners
- Native Americans
- Undocumented individuals

The purpose of the study is to evaluate the prevalence of salad bars at AZ public elementary and secondary schools participating in the NSLP and examine whether presence/absence of bars is related to various school level factors. As such, it is required that school nutrition managers in AZ NSLP-participating elementary and secondary school are included. We will sample all school nutrition managers (n=~1800) participating in the National School Lunch Program in Arizona.

4 **Number of Participant**

Indicate the total number of participants to be recruited and enrolled: We will recruit all school nutrition managers and anticipate at least 1200 completions

5 **Recruitment Methods**

- Describe when, where, and how potential participants will be identified and recruited.
- Describe materials that will be used to recruit participants. (Attach copies of these documents with the application.)

Participants will be recruited through the stages of ongoing emails from the Arizona Department of Education and ASU. The AZ Department of Education will send a scripted pre-invitation email to Food Service Directors informing the School Nutrition Managers of the study being conducted. A notice will be put in the weekly announcement email from the AZ Department of Education encouraging participation. ASU will follow up with an email to participants including the link to the survey. ASU will send up to 3-5 follow-up emails, at least one week apart. If participants have not responded to survey, ASU will make phone calls to the participants encouraging completion of the survey

6 **Procedures Involved**

Describe all research procedures being performed and when they are performed. Describe procedures including:

- Surveys or questionnaires that will be administered. (Attach all surveys, interview questions, scripts, data collection forms, and instructions for participants.)
- What data will be collected including long-term follow-up?
- Lab procedure and tests and related instructions to participants
- The period of time for the collection of data.
- Describe the amount and timing of any compensation or credit to participants.
- If the research involves conducting data analysis only, describe the data that that will be analyzed.

Participants will receive a link to a web-based Qualtrics survey. Participants will answer questions in three tracks: those who currently have salad bars, those who once had salad bars, and those who never had salad bars. We will be collecting data from March to the end of the 2013-2014 school year as needed. Each school nutrition manager who completes the online survey will receive a $5 online gift card to Amazon or Target for their participation. We understand that this incentive amount is relatively small, so in addition to the $5 gift card, participants will be entered into a drawing for the chance at $100 (n=2) and $50 (n=6) gift cards. If participants send us an email picture of their salad bar, then they will receive a second entry into the drawing.

Over the summer and the 2014-2015 school year, data analyses will take place. We plan to present findings at local and national conferences and disseminate to peer-reviewed journals.

7 **Risks to Participants**

List the reasonably foreseeable risks, discomforts, or inconveniences related to participation in the research. Consider physical, psychological, social, legal, and economic risks.

No foreseeable risks

8 **Potential Benefits to Participants**

Realistically describe the potential benefits that individual participants may experience from taking part in the research. Indicate if there is no direct benefit. Do not include benefits to society or others.

There may be no immediate benefit to the individual participants in this study. The only benefit is a small gift they will receive for participating ($5 online gift card to Target or Amazon with additional eligibility for the chance at $100 (n=2) and $50 (n=6) gift cards).

9 **Prior Approvals**

Describe any approvals – other than the IRB - that will be obtained prior to commencing the research. (e.g., school, external site, or funding agency approval.)

We have full support from the AZ Department of Education, who oversees the administration of the National School Lunch Program in Arizona.

10 **Privacy and Confidentiality**

Describe the steps that will be taken to protect subjects' privacy interests. "Privacy interest" refers to a person's desire to place limits on with whom they interact or to whom they provide personal information.

Describe the following measures to ensure the confidentiality of data:

- Where and how data will be stored?
- How long the data will be stored?
- Who will have access to the data?
- Describe the steps that will be taken to secure the data (e.g., training, authorization of access, password protection, encryption, physical controls, certificates of confidentiality, and separation of identifiers and data) during storage, use, and transmission.

The data will be securely stored on the ASU file server for a minimum of 7 years. Access to all data will be limited to the study's research staff. No personal identifiers will be stored with the data.

11 **Consent Process**

Indicate the process you will use to obtain consent. Include a description of:

- Where will the consent process take place
- How will consent be obtained

Non-English Speaking Participants

- Indicate what language(s) other than English are understood by prospective participants or representatives.
- If participants who do not speak English will be enrolled, describe the process to ensure that the oral and/or written information provided to those participants will be in that language. Indicate the language that will be used by those obtaining consent.

Waiver or Alteration of Consent Process (written consent will not be obtained, required information will not be disclosed, or the research involves deception)

- Review the "CHECKLIST: Waiver or Alteration of Consent Process (HRP-410)" to ensure you have provided sufficient information for the IRB to make these determinations.

Participants who are minors (individuals who are under 18)

- Describe the criteria that will be used to determine whether a prospective participant has not attained the legal age for consent to treatments or procedures involved in the research under the applicable law of the jurisdiction in which the research will be conducted.

The consent process will take place on the first page of the online survey. If participants consent, then they will move forward with the survey.

12 **Process to Document Consent in Writing**

If your research presents no more than minimal risk of harm to participants and involves no procedures for which written documentation of consent is normally required outside of the research context, the IRB will consider a waiver of the requirement to obtain written documentation of consent.

(If you will document consent in writing, attach a consent document. If you will obtain consent, but not document consent in writing, attach the short form consent template or describe the procedure for obtaining and documenting consent orally.)

13 **Training**

Provide the date(s) the members of the research team have completed the CITI training for human participants. This training must be taken within the last 3 years. Additional information can be found at: http://researchintegrity.asu.edu/training/humans

Bruening: 8/9/2012
Adams: 6/17/2013
Ohri-Vachaspati: 4/4/11
James, Darith: 9/2/2011
Hurley, Jane: 08/04/2013
Labansat, Derek: 2/4/14
Ingram, Tana: 6/30/2013!